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EXAMINER	
WEST, JEFFREY R	

ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/917,904	ELWOOD ET AL.	
	Examiner	Art Unit	
	Jeffrey R. West	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6,10-19 and 21-24* is/are rejected.

7)☒ Claim(s) *3-5,7-9,20,25 and 26* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1, 3, 6, 8-10, 14-18, 20, 25, and 26 are objected to because of the following informalities:

In claim 1, line 4, to avoid problems of antecedent basis, "a gas sensor" should be ---the at least one gas sensor---.

In claim 1, line 5, to avoid problems of antecedent basis, "the adjusted measurement" should be ---the adjusted percentage gas sensor lifetime hours measurement---.

In claim 1, line 5, to avoid problems of antecedent basis, "the gas sensor" should be ---the at least one gas sensor---.

In claim 1, line 6, to avoid problems of antecedent basis, "the sensor" should be ---the at least one gas sensor---.

In claim 1, line 7, to avoid problems of antecedent basis, "said gas sensor" should be ---the at least one gas sensor---.

In claim 3, lines 1-2, to avoid problems of antecedent basis, "the adjusted measurement" should be ---the adjusted percentage gas sensor lifetime hours measurement---.

In claim 3, line 2, to avoid problems of antecedent basis, "the gas sensor" should be ---the at least one gas sensor---.

In claim 3, lines 2-3, to avoid confusion, "normalized to an hour count and stored as a percentage measurement of lifetime hours used at a temperature of 20 degrees

Celsius in said embedded controller" should be ---normalized, in said embedded controller, to an hour count stored as a percentage measurement of lifetime hours used at a temperature of 20 degrees Celsius---.

Since in claim 1, it is a "measurement for the [at least one gas] sensor of a percentage lifetime hours used" (emphasis added) that is calculated for comparison with a respective maximum percentage hours, in claim 6, "percentage gas sensor lifetime hours measurement" should be something similar to ---percentage gas sensor lifetime hours used measurement---.

In claim 6, line 3, to avoid problems of antecedent basis, "said gas sensor" should be ---the at least one gas sensor---. A similar change should be made to claims 8 and 9.

In claim 10, line 5, to avoid problems of antecedent basis, "a gas sensor" should be ---the at least one gas sensor---.

In claim 10, line 6, to avoid problems of antecedent basis, "the adjusted measurement" should be ---the adjusted percentage gas sensor lifetime hours measurement---.

In claim 10, line 6, to avoid problems of antecedent basis, "a gas sensor" should be ---the at least one gas sensor---.

In claim 10, line 7, to avoid problems of antecedent basis, "the sensor" should be ---the at least one gas sensor---.

In claim 10, lines 6 and 7, to conform with the "system" steps, "normalizing" and "calculating" should be ---means for normalizing--- and ---means for calculating---, respectively.

In claim 10, line 9, to avoid confusion, "indicating said gas sensor failure" should be ---indicating failure of the at least one gas sensor---.

In claim 14, line 2, to avoid confusion, "a percentage gas sensor lifetime hours" should be ---the percentage gas sensor lifetime hours measurement---.

Since in claim 10, it is a "measurement for the [at least one gas] sensor of a percentage lifetime hours used" (emphasis added) that is calculated for comparison with a respective maximum percentage hours, in claim 15, "percentage gas sensor lifetime hours measurement" should be something similar to ---percentage gas sensor lifetime hours used measurement---.

In claim 15, line 4, to avoid problems of antecedent basis, "said gas sensor" should be ---the at least one gas sensor---. A similar change should be made to claims 16 and 17.

In claim 18, lines 4-5, to avoid problems of antecedent basis, "a gas sensor" should be ---the at least one gas sensor---.

In claim 18, line 6, to avoid problems of antecedent basis, "the adjusted measurement" should be ---the adjusted percentage gas sensor lifetime hours measurement---.

In claim 18, line 6, to avoid problems of antecedent basis, "the gas sensor" should be ---the at least one gas sensor---.

In claim 18, line 7, to avoid problems of antecedent basis, "the sensor" should be ---the at least one gas sensor---.

In claim 18, line 8, to avoid problems of antecedent basis, "said gas sensor" should be ---the at least one gas sensor---.

Since in claim 18, lines 7-8, it is a "measurement for the [at least one gas] sensor of a percentage lifetime hours used" (emphasis added) that is calculated for comparison with a respective maximum percentage hours, in claim 18, lines 9-10, "percentage gas sensor lifetime hours measurement" should be something similar to ---percentage gas sensor lifetime hours used measurement---.

In claim 20, line 2, to avoid problems of antecedent basis, "the adjusted measurement" should be ---the adjusted percentage gas sensor lifetime hours measurement---.

In claim 20, lines 2-4, to avoid confusion, "normalized to an hour count and stored as a percentage measurement of lifetime hours used at a temperature of 20 degrees Celsius in an embedded controller" should be ---normalized, in an embedded controller, to an hour count stored as a percentage measurement of lifetime hours used at a temperature of 20 degrees Celsius---.

In claim 20, line 2, to avoid problems of antecedent basis, "the gas sensor" should be ---the at least one gas sensor---.

In claims 25 and 26, to avoid problems of antecedent basis, "said gas sensor" should be ---the at least one gas sensor---.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 6, 10-19, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,701,415 to Dutton et al. in view of JP Publication No. 08-233770 to Hatai and further in view of U.S. Patent No. 6,279,377 to Cao.

Dutton discloses a controlled gas atmosphere incubator (column 4, lines 26-30) with a carbon dioxide sensor and an oxygen sensor disposed therein (column 7, lines 30-37 and 64-67) and an embedded controller that accesses a plurality of set points/values (column 10, lines 3-10) and monitors the set points/values for temperature and gas concentration changes to determine a failure condition (column 11, lines 19-45), wherein upon the occurrence of a failure condition, a re-settable alarm interface display is activated to indicate the failure condition to a user (column 11, line 45-49 and column 12, lines 11-16). Dutton also discloses a cumulative clock (i.e. timer) in the controller for use in the main testing operation (column 11, lines 10-18).

As noted above, Dutton teaches many of the features of the claimed invention. Dutton, however, discloses a general method for testing the operation of an incubator using oxygen and carbon dioxide sensor but doesn't provide a method for testing/predicting the life of the sensors themselves.

Hatai teaches an electrochemical gas sensor and a corresponding method for analyzing the gas sensor for lifetime adjustment values, at predetermined sensor operation time intervals determined by a clock, comprising obtaining lifetime data from the sensor, adjusting the lifetime data obtained based up a stored calculation rule, and comparing the adjusted lifetime data to predetermined thresholds (0013) in order to display warning results to a user in the form of deterioration indications of the sensor (i.e. predetermined values of no deterioration) (abstract). Hatai also teaches performing the adjusting with the calculation rule according to data stored in a look-up table of temperatures ranging from –10 to 50 degrees Celsius, including 20 degrees Celsius, (0015-0018) and further, since Hatai teaches determining the time when the adjusted sensor value has reaches a half deterioration (0020) it is considered inherent that the adjusted sensor value must be compared to its previous maximum value in order to determine when it reaches this point.

It would have been obvious to one having ordinary skill in the art to modify the invention of Dutton to include a method for testing/predicting the life of the sensors themselves, as taught by Hatai, because Hatai suggests that the combination would have provided the user a way to avoid complete failure of the sensors, thereby

giving the user time to replace the sensors, by notifying the user of the lifetime by detecting the deterioration of sensitivity easily and accurately (abstract).

While the invention of Dutton and Hatai doesn't specifically disclose performing the adjusting operation every hour, the combination does teach that the adjusting step should be set up at intervals corresponding to the actual environment of the sensor (Hatai, 0022). Therefore, it would have been obvious to one having ordinary skill in the art to specify that the adjusting step be executed hourly if this interval provided suitable accuracy for the current environment.

Further, although the combination of Dutton and Hatai doesn't specifically disclose that the life values are in the form of percentage hours, this limitation is not considered critical to the patentability of the invention since it would have been obvious to one having ordinary skill in the art to express the data in any form desired. Further, as indicated by the cited documents below, the Examiner takes Official Notice that it is well known in the art to determine the life of gas sensors in the form of percentage hours.

As noted above, the invention of Dutton and Hatai teaches many of the features of the claimed invention and while the invention of Dutton and Hatai does disclose adjusting the sensor life values based upon data stored in a table, the combination doesn't specifically define this process as normalizing the adjustments.

Cao teaches a method and apparatus for monitoring oxygen concentration including an oxygen concentration sensor, processor, display (column 3, lines 43-58) and re-settable alarm (column 5, lines 50-67). Cao also teaches calibrating the

monitoring device according to a table having oxygen concentration values, which are a function of pressure and temperature, wherein in order to perform calibration the actual output of the sensors are normalized to expected values defined in the table (column 7, lines 11-28).

It would have been obvious to one having ordinary skill in the art to modify the invention of Dutton and Hatai to include specifying that the adjusting step include normalization, as taught by Cao, because, as suggested by Cao, the combination would have accounted for differences in specific sensors used to monitor the gas concentrations in order to provide increasingly more accurate results (column 7, lines 11-28).

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dutton in view of Hatai and Cao, and further in view of U.S. Patent No. 5,741,413 to Capetanopoulos.

As noted above, Dutton in combination with Hatai and Cao teaches all of the features of the claimed invention except for holding a gas concentration and temperature constant over a previous hour before normalizing.

Capetanopoulos teaches a gas sensor and method of use as well as a method for calibrating/normalizing the gas sensor wherein prior to calibrating/normalizing the gas sensor, a gas concentration and temperature is held constant over a time interval (column 2, lines 46-57).

It would have been obvious to one having ordinary skill in the art to modify the invention of Dutton, Hatai, and Cao to include holding a gas concentration and temperature constant over a previous hour before normalizing, as taught by Capetanopoulos, because Capetanopoulos suggests that the combination would have provided a method for obtaining a constant output from the sensor thereby improving the accuracy of the normalization step by insuring that differences in the gas concentration/temperature do not skew the sensor readings (column 2, lines 46-57).

Further, Capetanopoulos suggests that it is well known that gas sensors need various amounts of time to accurately reflect the conditions of the environment (column 2, lines 7-14 and column 14-26) and therefore it would have been obvious to one having ordinary skill in the art to hold the gas concentration and temperature constant for whatever time is deemed necessary, such as one hour, to stabilize the readings.

Allowable Subject Matter

5. Claims 3 and 20 are objected to as being dependent upon a rejected base claim, and for various other informalities, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because while the cited prior art teaches many of the features of the claimed invention, the combination does not explicitly teach, in combination with the other claimed limitations for predicting failure of gas sensors in an incubator environment,

adjusting a percentage gas sensor lifetime hours measurement and normalizing the adjusted measurement to an hour count stored as a percentage of lifetime hours used (i.e. consumed) at a temperature of 20 degrees Celsius.

Response to Arguments

6. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

First, the Examiner asserts that it is accepted and admitted that it is well known in the art to determine the life of gas sensors in the form of percentage hours (See, MPEP 2144.03; "*If applicant does not traverse the examiner's assertion of official notice or applicant's traverse is not adequate, the examiner should clearly indicate in the next Office action that the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant either failed to traverse the examiner's assertion of official notice or that the traverse was inadequate.")*

The following arguments are also noted:

Applicant argues that "*Dutton, et al.* does not teach, *inter alia*, a method of predicting failure of gas sensors in an incubator environment comprising 'analyzing at least one gas sensor...adjusting a percentage gas sensor lifetime hours...normalizing the adjusted measurements... calculating a measurement for the sensor of a percentage lifetime hours used...and displaying a warning."

The Examiner asserts that the invention of Dutton is only included to teach a general method for testing the operation of an incubator using oxygen and carbon dioxide sensors.

Applicant then argues that "Hatai does not cure the deficiencies of Dutton, et al., because it, too, does not provide a teaching of testing/predicting the life of the sensors as recited in claim 1 and similarly in claims 10 and 18."

The Examiner asserts that Applicant has not clearly indicated what Hatai fails to teach and further asserts that Hatai does disclose testing/predicting the life of sensors by teaching an electrochemical gas sensor and a corresponding method for analyzing the gas sensor for lifetime adjustment values, at predetermined sensor operation time intervals determined by a clock, comprising obtaining lifetime data from the sensor, adjusting the lifetime data obtained based up a stored calculation rule, and comparing the adjusted lifetime data to predetermined thresholds (0013) in order to display warning results to a user in the form of deterioration indications of the sensor (i.e. predetermined values of no deterioration) (abstract).

Applicant also argues that "*Hatai* teaches away from the present invention as claimed" because "*Hatai* is designed with gas sensor elements to detect carbon monoxide (CO) gas whereas the present invention tracks O_2 and CO_2 values. Carbon monoxide is all together different from the operating environment of the present invention. As denoted, for instance, in Applicant's specification, the incubator chamber preferably houses biological cultures. Such cultures are conducive to being destroyed in an environment of carbon monoxide as taught by

Hatai. Thus, the apparatus of *Hatai* would not only fail to work properly, but would also be destructive to Applicant's invention."

The Examiner asserts that the invention of Hatai is included to modify the invention of Dutton to include a method for analyzing gas sensors for lifetime adjustment values. Such a combination would not destroy the invention of Dutton and, since Applicant's invention is not being modified, it would not be destructive to Applicant's invention. Further, adding the sensor analyzing method of Hatai to a primary reference does not change the environment of the primary reference to be that of carbon monoxide, but instead adds the method for monitoring the sensors to the present environment of the primary reference.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure:

U.S. Patent Application Publication No. 2001/0032109 to Gonyea et al. teaches a system and method for predicting a maintenance schedule and costs for performing future service events of a product including normalizing the operating hours as hours of operation of the equipment under normal operating conditions.

Apogee, "Oxygen Sensor (Model O2S)" teaches an oxygen sensor having a life expectancy expressed in percent-hours.

General Monitors, "G-Series Portables" teaches a multi-gas sensor that indicates the remaining life of the sensor in 0-100 percent-life.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw
September 2, 2004

MARC S. HOFF
SUPERVISORY PATENT EXAMINER
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